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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Avinash Dalmia

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EXAMINER

OLSEN, KAJ K

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 05/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	<p>Application No.</p> <p>10/007,234</p>	<p>Applicant(s)</p> <p>DALMIA ET AL.</p>	
	<p>Examiner</p> <p>Kaj K Olsen</p>	<p>Art Unit</p> <p>1753</p>	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 March 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Double Patenting***

1. Claims 13 and 14 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 3 and 11 respectively. Similarly, claim 16 is a substantial duplicate of both claims 14 and 11, and claim 17 is a substantial duplicate of claim 12. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Independent claims 1, 13, and 16 all specify that electrolyte material be spaced apart from the surface of the substrate. However, it doesn't appear from the figures that this is the case. In particular, figure 2 would appear to show that the electrolyte 30 is in contact with a surface of the substrate. It would appear that the electrolyte is only spaced apart from the substrate wherever the conductive film or a notch is located. The claims don't specify that distinction and it is unclear how to interpret a claim limitation that doesn't appear to read on the applicant's disclosed subject matter.

*Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-4, 6, 8, 9, 13, and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Shiratori (USP 6,218,036 B1).

7. With respect to the claims as best understood, Shiratori discloses an electrochemical cell that comprises a substrate (5, 6) having notches for holding gas, an electrolytic material (8, 18) extending over the surface of the substrate, and a film of conductive material (7, 9) placed between and in contact with both the substrate surface and the electrolyte material (fig. 1, 2A, and col. 2, lines 30-58). Although the cell is not disclosed as being a sensor, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability.

8. With respect to the second film of conductive material, Shiratori has two electrodes (7, 9) and either one of those electrodes reads on the broadly specified “on at least one area of said notch”.

9. With respect to the claims specifying either deposition or etching to construct the sensor, the determination of patentability for the claim is based on the product itself. Because the

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product of the claim is identical to the invention of Shiratori the process from which it was made is the same as or obvious over the process utilized by Shiratori (see *In re Thorpe*, 777 F.2d 695, 698).

10. Claims 1, 3, 4, 6-9, and 11-17 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sugama et al (USP 5,492,611).

11. Sugama discloses an electrochemical sensor comprising a substrate 201 having at least one notch in said substrate (fig. 2(c)), an electrolyte 206 extending over the surface, and a conductive film (204, 205) placed in contact with the surface and the electrolyte material (col. 2, lines 7-40). Although the electrolyte isn't always spaced apart from the substrate (it is only spaced apart where the conductive films reside), it doesn't appear the instant invention requires the electrolyte be spaced apart wherever the conductive film is not present (see 112 rejection above).

12. With respect to the second film of conductive material, electrode 204 would read on this limitation. Said electrode is placed in said notch (fig. 2(c)).

13. With respect to the second electrolyte material, the distribution of electrolyte 206 mirrors the distribution of first and second electrolytes shown by the instant invention (i.e. electrolyte being placed both on top of the substrate over the conductive film 205 as well as in the actual notches over film 204). Although Sugama doesn't disclose its electrolyte as two separate entities, the claims make no distinction about how the electrolytes are distributed or that the electrolytes constitute different entities. The claims merely state that there are electrolytes that occupy different locations of the sensor and Sugama teaches this.

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14. With respect to the electrolyte being a polymer or a solid, see col. 2, line 50 through col. 3, line 46.

15. With respect to the claims specifying either deposition, etching, or spin coating to construct the sensor, the determination of patentability for the claim is based on the product itself. Because the product of the claim is identical to the invention of Sugama the process from which it was made is the same as or obvious over the process utilized by Sugama (see *In re Thorpe*, 777 F.2d 695, 698).

***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

18. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugama '611 in view of Clark et al (USP 5,194,133).

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19. Sugama set forth all the limitations of the claim, but did not explicitly recite the use of glass as a substrate. Clark teaches in an alternate notched electrochemical sensor that materials other than silicon (which Sugama utilized) can find utility as a sensor substrate. One of those materials is glass (col. 2, lines 27-30). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Clark for the sensor of Sugama because the substitution of one known substrate material for another known substrate material requires only routine skill in the art. In addition, glass is a cheaper material than silicon and doesn't require the application of an insulating silicon dioxide coating. It also would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Clark for the sensor of Sugama in order to provide a less expensive substrate that doesn't require surface treatment prior to use.

20. Claim 10 (and claims 7 and 8 in the alternative) is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugama '611 in view of Kusanagi et al (USP 5,315,643).

21. Sugama disclose all the limitations of claim 10, but doesn't not explicitly set forth the use of Nafion as the electrolyte. However, the use of Nafion as an electrolyte is notoriously old in the art of gas sensing. In particular, Kusanagi disclose the use of Nafion polymer as the electrolyte for its gas sensor, which has the advantage of being able to be deposited as very thin layers (col. 4, line 43 through col. 5, line 3). A thin layer electrolyte would improve both the sensor signal (owing to the reduced resistance) and the sensor's response times (owing to the thin layer). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Kusanagi for the sensor of Sugama because the

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substitution of one known electrolyte material for another known electrolyte material requires only routine skill in the art, and in order to improve the sensor's response and response times.

### ***Response to Arguments***

22. Applicant's arguments filed on 3-4-2004 have been fully considered but they are not persuasive. With respect to the 112 rejection, applicant urges that the electrolyte 30 is spaced apart from the substrate at all locations. This doesn't appear to be the case for fig. 2 (the figure the examiner was alluding to). It appears to show the electrolyte 30 directly abutting the substrate 12 in contradiction to the claims. If applicant believes fig. 2 is being misinterpreted, is an accidental teaching of having the electrolyte abut the substrate, or is an embodiment of the invention that is not being claimed, then the applicant is invited to clarify on record why fig. 2 does not contradict the claims. Until said clarification, the examiner will maintain this rejection.

23. With respect to the rejection relying on Shiratori, applicant urges that the electrode cannot be in contact with the substrate because the charge collector is placed between the substrate and the electrode. This is unpersuasive for two reasons. One, the claims does not specify direct contact, just merely contact between the substrate and electrode. In the case of Shiratori, the electrode are pressed against the substrate and are hence "in contact" with the substrate regardless of whether the contact is direct or not. Although the contact of the instant invention might differ from the contact of Shiratori, the examiner is giving the claim language its broadest reasonable interpretation. Second, the charge collectors of Shiratori can reasonably be construed as being part of the electrode because they form the conductive base for the cell of Shiratori. By comparison, the instant invention construes the element 40 of the instant invention



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as being the electrode. Element 40 of the instant invention is functioning both as the actual electrode itself (i.e. the portion of 40 that is in contact with the gas) as well of the charge carriers for the electrode (i.e. the portions of 40 not in contact with the gas). This is precisely analogous to what the combination of elements 3 and 7 (or 4 and 9) are functioning as in Shiratori. There is nothing in the rejected claims that state that the electrode must be of homogeneous construction.

24. With respect to the rejection relying on Sugama, applicant urges that insulating layer 203 is between the substrate and the electrode in contradiction to the claimed invention. This is unpersuasive for three reasons. One, the electrode of Sugama is in contact with the substrate giving "in contact" its broadest reasonable interpretation (see discussion in the preceding paragraph). Two, insulating layer 203 is part of the substrate. In particular, the insulator is placed over the substrate 201 in order to ensure that the conductivity of the substrate does not interfere with the sensor operation. See col. 2, lines 5-11. A coating placed over a substrate can be reasonably be construed as being part of the substrate. There is nothing in the claims that state that the substrate cannot be coated with a film. Three, even if the claim were construed as requiring direct contact between the substrate and the electrode and the insulating material were not construed as being part of the substrate, the claim would alternately be rejected with the combination of Sugama and Clark (see rejection for claim 5). In particular, Clark taught the use of a glass substrate over a silicon substrate. Because glass is already insulating, there would be no need for the insulating layer of Sugama and the electrode would be in direct contact with the substrate.

***Conclusion***

25. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Thursday from 6:30 A.M. to 4:00 P.M. and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Kaj Olsen', with a long, sweeping horizontal line extending to the right.

Kaj Olsen Ph.D.  
Primary Examiner  
AU 1753  
May 13, 2004